

TBD07 – (Part 07) Enzymes

Name _____

1. B.7.1 **Describe** the characteristics of biological catalysts (enzymes). (2) *Include: enzymes are proteins; activity depends on tertiary and quaternary structure; and the specificity of enzyme action.*

- What does an enzyme do?
- Explain what a substrate is:
- Explain what the active site is:
- How are enzymes specific?

2. B.7.2 **Compare** inorganic catalysts and biological catalysts (enzymes). (3)

	Inorganic Catalysts	Biological (enzyme) Catalysts
Environment Necessary		
Function		

3. B.7.3 **Describe** the relationship between substrate concentration and enzyme activity. (2)

- How is enzyme activity measured? What are the units?
- What happens at low substrate concentrations? What's the order?
- What happens as substrate concentration is increased? What's the order?
- What happens when substrate concentration no longer has an effect on the rate? What's the order?
- Draw a diagram of enzyme activity vs substrate concentration. Label, V_{\max} , $V_{\max}/2$, K_m , and axis:

4. B.7.4 **Determine** V_{\max} and the value of the Michaelis constant (K_m) by graphical means and explain its significance. (3)

- What happens to the relative number of active sites and substrate molecules as the substrate concentration is increased? This should agree with your responses to B.7.3.
- The Michaelis Menten Theory assumes what process occurs? What are the equations that coincide?
- Explain $V_{\max}/2$ and the Michaelis constant, K_m :
- Use the lock and key model to demonstrate specificity:

5. B.7.5 **Describe** the mechanism of enzyme action, including enzyme substrate complex, active site and induced fit model. (2)
- Using the equation given, describe (or diagram) the process of enzyme action:
 - What is the induced fit model and how is it different than the lock and key model?

6. B.7.6 **Compare** competitive inhibition and non-competitive inhibition. (3)

	Competitive Inhibition	Non-competitive Inhibition
Diagram of active site		
Information regarding Inhibition		
Graph of enzyme activity vs substrate concentration		

7. B.7.7 **State and explain** the effects of heavy metal ions, temperature changes and pH changes on enzyme activity. (3)

	Information regarding change	Graph of change in factor
Temperature		
Heavy metal ions		
Acidity (pH)		